MUELLER Electronics
... we CAN do it!

Installation and operating instructions

BASIC-Terminal TOP

Last update: V5.20130422

30322521-02-US

Read and follow this operating instructions.

Keep this operating instructions for future reference.

Document

Installation and operating instructions
Product: BASIC-Terminal TOP
Document number: 30322521-02-US

Mueller Electronics, Inc.
7700 Brush Hill Drive, Suite 103A
Burr Ridge, IL 60601
USA
Phone: +1(855) ME ISOBUS

Email: info@mueller-electronics.com
Website: http://www.mueller-electronics.com

Contents

1	For your safety	6
1.1	Basic safety instructions	6
1.2	Layout and meaning of warnings	6
1.3	User requirements	7
1.4	Intended use	7
1.5	EC declaration of conformity	7
2	About these Operating Instructions	8
2.1	Target group of these Operating Instructions	8
2.2	Layout of operating instructions	8
2.3	Layout of references	8
3	Product description	9
3.1	Performance description	9
3.2	Scope of delivery	9
3.3	System requirements	10
3.4	Correctly interpreting information on the nameplate	10
4	Mounting and installation	11
4.1	Mounting the display in the tractor cab	11
4.1.1	Screwing on the GSM antenna	11
4.1.2	Display ports	12
4.2	Connecting the display to the basic equipment	12
4.3	SIM card	12
4.3.1	Inserting the SIM card	13
4.4	Connecting the GPS Receiver to the display	14
4.5	Connecting sensors to the display	15
5	Basic control principles	17
5.1	Getting to grips with the controls	17
5.2	Initial start-up	18
5.3	Configuration sequence	19
5.4	Using the function keys	20
5.5	Restarting the display	20
5.6	Inputting data	21
6	Opening applications in the selection menu	22
6.1	Display layout in the selection menu	22
6.2	Opening applications	22
6.3	Segmentation of the display	23

7	Configuring the display in the Service application	25
7.1	Controls in the Service application	25
7.2	Icons in the Service application	26
7.3	Changing the language	26
7.4	Configuring the basic display settings	27
7.5	GPS Receiver	28
7.5.1	Activating the GPS Receiver	29
7.5.2	Configuring the GPS receiver	30
7.6	Configuring the "GPS TILT-Module" terrain compensation	32
7.7	Activating an external LightBar	33
7.8	Camera	34
7.8.1	Activating a camera	34
7.8.2	Operating the camera	34
7.9	Configuring the joystick button allocations	35
7.10	Adjusting the brightness for day or night mode	37
7.11	Activating and deactivating applications	38
7.12	Activating licenses for full versions of the software	39
7.13	Setting the purpose of the display	40
7.14	Deleting files from the USB flash drive	41
7.15	Deleting pools	41
7.16	Activating the "Diagnostics" function	42
7.16.1	Jobcomputer diagnostics	43
7.17	Screenshots	43
7.17.1	Configuring the screenshots function	43
7.17.2	Creating screenshots	44
7.18	CAN-Trace settings	44
7.19	Configuring farmpilot	45
7.19.1	Activating farmpilot	45
7.19.2	Configuring the connection with farmpilot	46
7.19.3	Configuring the GPRS connection manually	47
7.19.4	Sending diagnostic data to the portal	48
8	Tractor-ECU application	50
8.1	Adding a vehicle profile	50
8.2	Configuring the parameters for a vehicle profile	51
8.2.1	Calibrating the speed sensor	54
8.2.2	Configuring a working position sensor	55
8.2.3	Entering the position of the GPS Receiver	56
	For machines fitted with an ISOBUS job computer	57
8.3	Activating vehicle profiles	58
9	ISOBUS-TC task processing	59
9.1	Adjusting how you use ISOBUS-TC	59

10	Maintenance and servicing	60
10.1	Servicing and cleaning the display	60
10.2	Disposing of the unit	60
10.3	Instructions on retrofitting	60
10.4	Checking the software version	61
10.5	Technical specifications	61
10.5.1	Technical specifications of the display	61
10.5.2	Pin assignment of port A	62
10.5.3	Pin assignment of port B	63
10.5.4	Pin assignment of port C	64
10.5.5	Pin assignment of camera ports 1 and 2	65
11	Notes	67

1 For your safety

1.1 Basic safety instructions

Please read the following safety instructions carefully before operating the product for the first time.

- Before maintenance or repair to the tractor, always disconnect the tractor from the display.
- Before charging the tractor battery, always disconnect the connection between the tractor and the display.
- Before welding to the tractor or a trailer device, always disconnect the power supply to the display.
- Do not make any unauthorized modifications to the product. Unauthorized changes or unauthorized use may impair your safety and influence the lifespan or function of the product. Modifications are considered unauthorized if they are not described in the product documentation.
- Follow all recognised safety, industrial and medical rules as well as all road traffic laws.

1.2 Layout and meaning of warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

⚠ WARNING

This signal word identifies medium-risk hazards, which could potentially cause death or serious bodily injury, if not avoided.

⚠ CAUTION

This signal word identifies low-risk hazards, which could potentially cause minor or moderate bodily injury or damage to property, if not avoided.

NOTICE

This signal word identifies actions which could lead to operational malfunctions if performed incorrectly.
These actions require that you operate in a precise and cautious manner in order to produce optimum work results.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning will appear in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

Example

1. NOTICE! This is a notice. It warns that there is a risk involved in the next step.
2. Step involving risk.

1.3 User requirements

- Learn how to operate the display correctly. The display must not be operated by anyone who has not read the Operating Instructions.
- Please read and carefully observe all safety instructions and warnings contained in these Operating Instructions and in the manuals of any connected vehicles and farm equipment.

1.4 Intended use

The display is intended exclusively for use in agriculture as well as in wine-growing, fruit-cultivating, and hop-growing operations. The manufacturer cannot be held responsible for any installation or use of the display that deviates from or exceeds the scope of intended use.

The manufacturer cannot be held liable for any personal injury or property damage resulting from such improper use. All risks involved in engaging in improper usage, lie solely with the user.

Intended use also includes the adherence to the conditions for operation and repairs prescribed by the manufacturer.

The manufacturer cannot be held liable for any personal injury or property damage resulting from such non-observance. All risk involved during improper use lies with the user.

All applicable accident prevention regulations and all other generally recognized safety, industrial, and medical rules as well as all road traffic laws must be observed. Any unauthorized modifications made to the unit will void the manufacturer's warranty.

1.5 EC declaration of conformity

This product has been manufactured in conformity with the following national and harmonised standards as specified in the current EMC Directive 2004/108/EC:

- EN ISO 14982

2 About these Operating Instructions

2.1 Target group of these Operating Instructions

These Operating Instructions are intended for personnel entrusted with installing and operating the display.

2.2 Layout of operating instructions

The operating instructions explain step by step how you can perform certain operations with the product.

We use the following symbols throughout these Operating Instructions to identify different operating instructions:

Type of depiction	Meaning
1. 2.	Actions that must be performed in succession.
⇨	Result of the action. This will happen when you perform an action.
⇨	Result of an operating instruction. This will happen when you have completed all steps.
☑	Requirements. In the event that any requirements have been specified, these must be met before an action can be performed.

2.3 Layout of references

If any references are given in these Operating Instructions, they will appear as:

Example of a reference: [➞ 8]

References can be identified by their square brackets and an arrow. The number following the arrow shows you on what page the chapter starts where you can find further information.

3 Product description

3.1 Performance description

Hardware

The display is available in two hardware versions:

- With GSM modem and with camera connections
  - Complete functionality:
  - It is the prerequisite for work with the farmpilot portal;
  - On the rear side you can find two camera connections and one connection for the GSM antenna.
- Without GSM modem and without camera connections

You can find out the display version you have on the connections on the display rear side. [→ 12]

Software

All applications of Mueller-Electronics available are installed on the display. But first you must activate some of them.

See also: Activating licenses for full versions of the software [→ 39]

The following applications are activated:

- SERVICE – this application configures the display.
- ISOBUS-TC – this is the certified ISOBUS task controller from Mueller-Electronics. In this application you can use the display for processing all tasks previously planned on the PC.
- ISOBUS-UT - interface for controlling ISOBUS-job computers. The display is compliant with ISOBUS standard ISO 11783. This display can be used as the control unit independently of the manufacturer as an independent display on all machines that meet the requirements of this ISOBUS standard.
- Tractor-ECU - this application enables you to configure all sensors connected to the display and to input the position of the GPS receiver.

You can test the following application for 50 hours free of charge:

- TRACK-Leader – a modern system enabling the driver of an agricultural vehicle keep exact parallel lanes on the field.
- SECTION-Control – automatic boom section switching. Additional module for TRACK-Leader.
- VARIABLE RATE-Cont. – with this application you can work with prescription maps saved as shp files. Additional module for TRACK-Leader.
- TRACK-Leader TOP – automatic steering. Additional module for TRACK-Leader.
- FIELD-Nav – this is the first navigation software that contains all navigable paths, takes movement restrictions into account and leads directly to the field or other agricultural destination.

3.2 Scope of delivery

The following items are included in delivery:

- Display
- Installation and Operating Instructions
- Bracket for mounting the display
- USB flash drive

3.3 System requirements

The following requirements must be met for the tractor to be used in conjunction with the display:

- The tractor must be ISOBUS-capable.

If your tractor is not ISOBUS-capable, you can upgrade it. Our staff will be glad to advise you on selecting compatible components.

Requirements for the Farm Management Information System:

- The field catalog must be ISO-XML-compatible.

System requirements for using the farmpilot portal:

To use the farmpilot portal, you will require a display with a built-in GSM modem.

The following displays are currently equipped with a modem:

- BASIC-Display GSM item no.: 30322512
- BASIC-Display TOP GSM item no.: 30322522
- COMFORT-Display GSM item no.: 30322527

If you bought a display without a GSM modem, you can retrofit it with a GSM modem later. Please call our Customer Services department.

3.4 Correctly interpreting information on the nameplate

On the reverse of the display you will find a nameplate sticker. On this sticker you can find all the information you need to definitively identify the product.

Have these details ready when you contact Customer Services.

Nameplate on the reverse of the display

1	Customer number If the product was manufactured for an agricultural machinery manufacturer, the agricultural machinery manufacturer's item number will be shown here.	4	Operating voltage The product may only be connected to voltages within this range.
2	Hardware version	5	Software version If you update the software, this version will no longer be up-to-date.
3	Mueller-Electronics item number	6	Serial number

4 Mounting and installation

Mount the display and all additional components in the following order:

1. Mount the display in the tractor cab. [→ 11]
2. Connect the display to the basic equipment. [→ 12]
3. Connect the display to the GPS receiver. [→ 14]
4. Connect the display to other components.

4.1 Mounting the display in the tractor cab

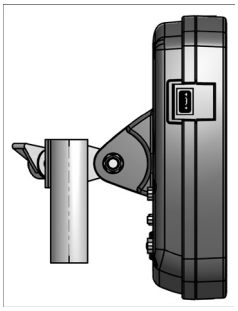
NOTICE

Electromagnetic interference
The operation of the display may be impaired by electromagnetic waves emitted by other farm equipment.

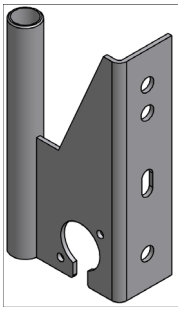
- Mount the display at least 1 m away from the radio antenna or from a radio device.

Procedure

1. Screw the bracket to the display.



2. Mount the display with the bracket installed inside the tractor cab.
   For instance, you can use the ME mounting bracket for this purpose.
   The mounting bracket is not included in the display delivery. It belongs to the delivery scope of ISOBUS basic equipment.



Mounting bracket

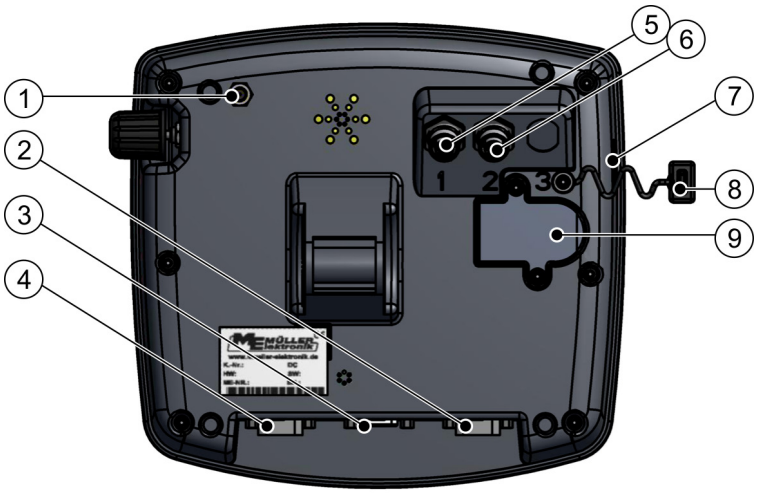
4.1.1 Screwing on the GSM antenna

The GSM antenna transmits information to the farmpilot portal via a mobile phone network.

Procedure

1. NOTICE! There is a very sensitive contact pin in the center of the GSM antenna. Make sure not to damage the contact pin when screwing on the GSM antenna.
2. Screw the GSM antenna on the rear side of the display.

4.1.2 Display ports



Rear of the display. Version with a GSM modem and camera connections

1	GSM antenna port Only for displays with a GSM modem installed.	6	Port for analog camera Only for displays with a GSM modem installed.
2	Port C RS232 serial port for: - GPS receiver - Terrain compensation "GPS TILT-Module" - LightBar	7	USB port USB 1.1
3	Port A CAN bus port For connection of ISOBUS basic equipment or voltage supply with TRACK-Guide II.	8	Covering cap for USB port Prevents dust from entering the USB socket.
4	Port B See section: Pin assignment of port B [→ 63]	9	SIM card slot
5	Port for analog camera Only for displays with a GSM modem installed.		

4.2 Connecting the display to the basic equipment

Where the display shall work with ISOBUS job computers, you need to connect it to ISOBUS basic equipment.

Procedure

1. Connect the 9-pole cable of the basic equipment to port A of the display.
2. Tighten the safety screws on the port.

4.3 SIM card

The display must be equipped with a SIM card so that you can use the farmpilot portal. If you do not intend to use the farmpilot portal, you will not need any SIM card.

Which SIM card?

You must purchase the SIM card from your mobile phone provider.

Select a mobile phone provider that can guarantee good mobile phone reception on your fields. A good connection is required in order for your work with the farmpilot portal to run smoothly.

The SIM card must meet the following requirements:

- It must be GPRS-capable.
- It must be PIN-free. Inform your mobile phone provider about this requirement before purchasing the SIM card.
- The contract must enable data transfer.

4.3.1 Inserting the SIM card

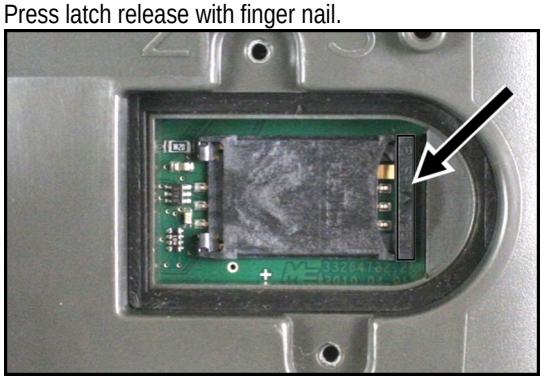
Required tool

- Torx TX10 screwdriver

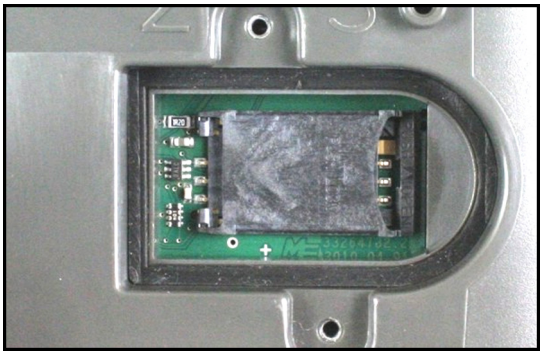
Procedure

1. Switch off the display and disconnect all cable connections to other equipment.
2. Unscrew the SIM card cover on the reverse of the display. Use a Torx TX10 screwdriver.

3. Press latch release with finger nail.

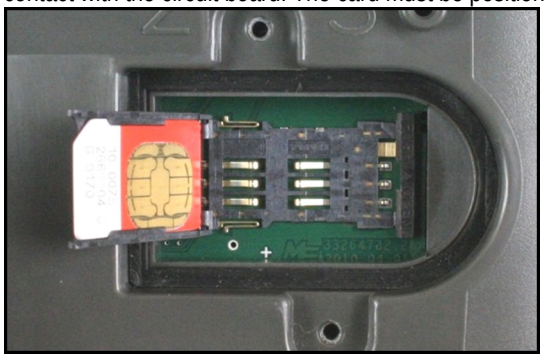


⇨ Card holder will be unlatched:

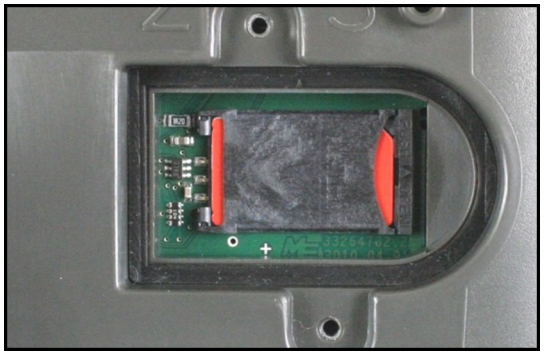


4. Raise the card holder. The card holder can be raised on the right hand side where the casing is rounded. The card holder is held in place by hinges on the other side.

5. Slide the SIM card into the card holder. Following installation, the chip on the card must be in contact with the circuit board. The card must be positioned as shown in the picture.



6. Shut the card holder.



7. Press the card holder lightly onto the circuit board, until it clicks into place on the right hand side.
8. CAUTION! Tighten the screws, but not too tight, otherwise the cover might be damaged.
9. Screw the cover back on. Make sure that the rubber seal is positioned between the cover and the casing.

4.4 Connecting the GPS Receiver to the display

Prerequisites

Each GPS receiver which is connected to the display must fulfill the conditions in the next table. GPS receivers, which can be purchased from Mueller-Electronics, fulfill these conditions.

Technical requirements for using the DGPS Receiver

Operating voltage:	Supply voltage of the display – 1.5 V
Current consumption	Maximum of 200 mA (at 158 °F) without any additional load from other appliances (the current consumption of the multifunctional grip and LightBar have already been taken into account in this specification.)
GPS standard	NMEA 0183
Refresh rates and signals	5 Hz (GPGGA, GPVTG)
	1 Hz (GPGSA, GPZDA)
Transmission rate	19200 baud

Data bits	8
Parity	no
Stop bits	1
Flow control	none

⚠ CAUTION

Damage to the equipment caused by short circuit
Pin 4 of port C is live. The voltage depends on the operating voltage of the display and is used to supply the DGPS Receiver A100 supplied by Mueller-Electronics.
Other GPS Receivers may suffer damage if connected to this port.
Before connecting a different GPS Receiver:

- Check what voltage the display is connected to (12 V or 24 V).
- Check the pin assignment of the GPS Receiver.
- Check the allowable voltage for the GPS Receiver.
- Compare the display voltage to the allowable voltage for the GPS Receiver.
- Compare the pin assignment.
- Only connect the GPS Receiver to the display, if the voltage range and pin assignment of both devices don't differ from each other.

During initial start-up it can take approx. 30 minutes until the GPS Receiver has aquired a signal. At subsequent start-ups it will only take approx. 1-2 minutes.

Procedure

☑ The GPS receiver is mounted on the roof of the tractor.

☑ You have activated a suitable driver. [➙ 29]

1. - Switch off the display.
2. Guide the connection cable from the GPS receiver into the cab.
3. CAUTION! Ensure that the cable is not laid across sharp edges or at risk of becoming bent. Lay the cable in a place where nobody can trip over it.
4. Connect the connecting cable of the GPS receiver to port C on the display.

4.5 Connecting sensors to the display

The display provides you with the possibility of connecting a sensor or the tractor's 7-pole signal socket to port B. This allows you for example to use the working position signal in the TRACK-Leader parallel guide.

Most sensors which can be purchased from Mueller-Electronics are fitted with a round 3-pole plug. In order to connect this to the display, you will need an adapter cable. A different adapter cable is needed for each hardware version of the display.

Adapter cable by hardware version

Hardware version of the display	Adapter cable	Connection	Item number
From 3.0.0	3-pole plug	Adapter cable, 9-pole bushing to 3-pole	31302499
From 1.4.1	3-pole plug	Adapter cable, 9-pole socket to 3-pole	31302497

You can also connect the display to the signal socket.

Cable to the signal socket

Hardware version of the display	Connections	Connection	Item number
From 3.0.0	7-pole to 9-pole socket	Cable direct to the signal socket Transfers the speed, PTO revolution, working position.	30322548
All	3-pole (from the adapter cable, dependent on the hardware version) to 7-pole.	Cable to the signal socket Only transfers the working position.	313008

5 Basic control principles

5.1 Getting to grips with the controls

Display controls

1	Rotary knob	3	Keys
2	Function keys		

Controls

Rotary knob

The rotary knob is located in the top right hand corner of the display.

Control with the rotary knob may vary slightly between the different applications.

You can use the rotary knob to perform the following actions:

Turning the rotary knob:

- Move the cursor up and down.
- Change a parameter value.

Pressing the rotary knob:

- Click on the selected line.
- Activate parameter.
- Confirm input.

Function keys

Operating the function keys is the same across all applications.

Performing the functions depicted on the display

Keys

Switch the display on and off

	Has no function
	Has no function
ESC	Exit screen
	Cancel input
	Hide warning messages and alerts
	Open the "Selection Menu" application
	Exit the "Selection Menu" application

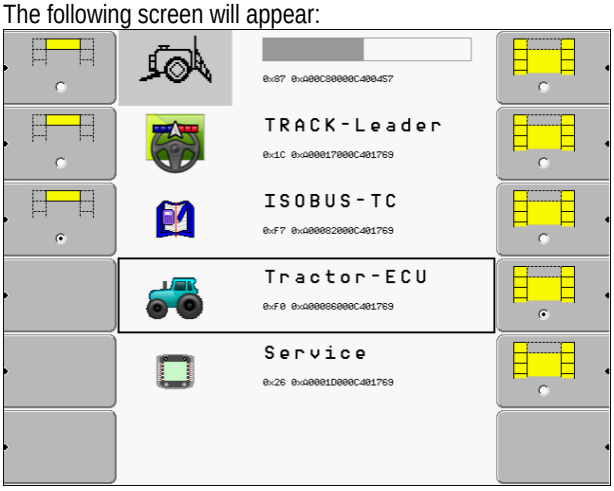
5.2 Initial start-up

Procedure

This is how you start the display for the first time:

☑ You have mounted and connected the display.

1. - Switch on the display.
2. Wait for approx. 15 seconds until all applications have been loaded.
3. - Open the "Selection menu" application.
   ⇨ The following screen will appear:



   ⇨ You are now in the selection menu.
   ⇨ When the display is connected to an ISOBUS job computer, they will be now loaded. The progress of this process is indicated by the progress bar next to the job computer icon. The time taken to complete this process depends on the number of connected job computers.
4. Wait until all job computers have been loaded.

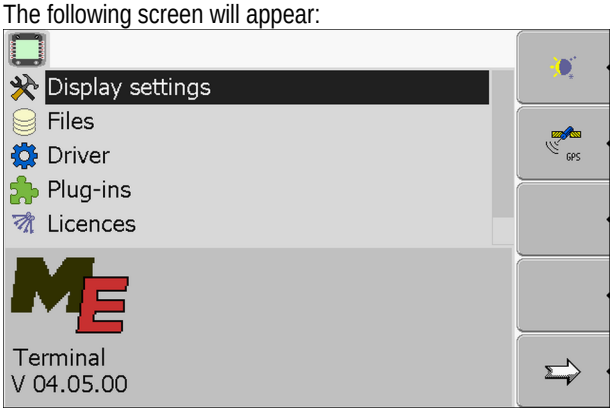
⇨ The following screen will appear:

The job computers are loaded when no more progress bars are displayed.

5. In the selection menu you can select which application you wish to display next.
6. - Select the "Service" line. The "Service" line must be framed by a black square:

7. - Click on the "Service" line.

⇨ The following screen will appear:



⇨ You have opened the "Service" application.

8. Configuring the display in the Service application [➞ 25]

5.3 Configuration sequence

Depending on the display that you have and which apps are activated, you will need to configure the display and its accessories in different points.

You must make these settings during the initial commissioning:

- Activating the GPS Receiver [➞ 29]
- Configuring the GPS receiver [➞ 30]
- Entering the position of the GPS Receiver [➞ 56]
- Adjusting how you use ISOBUS-TC

Once you have made these settings, the display is ready to operate.

Note however that you will need to configure the TRACK-Leader and FIELD-Nav applications in detail. To do this, read the instructions for these applications.

The number of settings is dependent on the number of functions that you are using, and which machines are operated with the display.

5.4 Using the function keys

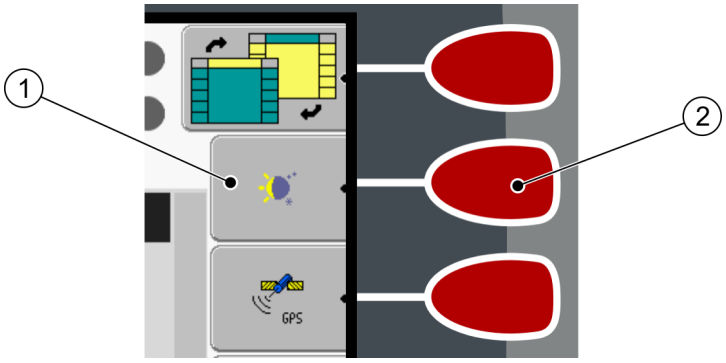
Whenever you use the function keys, you will activate the function depicted on the adjacent function icon.

⚠ CAUTION

Danger of pressing the function keys without care
When pressing function keys, components of the connected machine can be moved or activated.
As a result, people can be injured and property damaged.
Before pressing a function key:

- Make sure you know what will happen when you press the function key.
- Consult the Operating Instructions of the connected machine or of the agricultural equipment to establish what dangers could arise from pressing that key.
- Fulfill all the measures described in the machine's Operating Instructions in order to avoid danger.
- Only press the function key when you are sure that no danger is posed to people or property.

When you press a function key, the function / operation depicted on the function icon will be performed.



Using the function keys

1	Function icon Depiction of an available function.	2	Function key Performs the function depicted on the function icon.

Example

When you press the function key 2, the function depicted on the function icon 1 will be activated.

If no function icon appears next to a function key, this means that this function key has no function at present.

5.5 Restarting the display

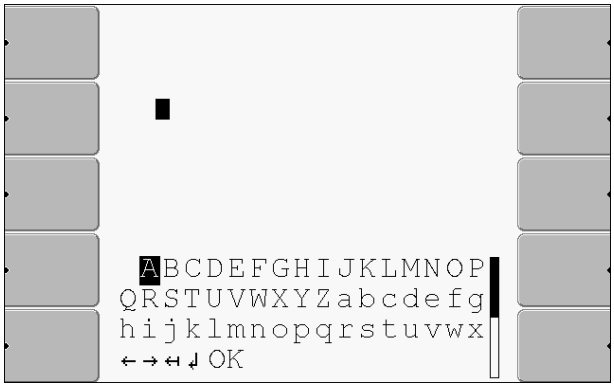
When restarting the display, you must give the connected jobcomputers enough time to restart as well. For this reason, always wait approx. 30 seconds after switching off the display before switching the display back on.

Procedure

1. - Switch off the display.
2. Wait 30 seconds until the jobcomputers have also been switched off.
3. - Switch on the display.

5.6 Inputting data

All data must be entered on the data input screen.



Data input screen

Controls

Below the characters, you will find 5 icons which will assist you when entering the data.

Delete characters

Move cursor to the left

Move cursor to the right

Confirm and finish input.

No function

Procedure

This is how you enter the data:

☑ The data input screen has been opened:

1. - Select the desired character.
2. - Click on the selected character.
3. When all characters have been entered, select the "OK" symbol with the rotary button and click.

⇨ The input will be applied.

6 Opening applications in the selection menu

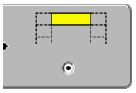
In the selection menu you can choose which application you wish to view on the display.

You can open the selection menu at any time. This will not close the application currently running.

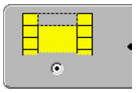
Controls

Open the selection menu

Press again – open the most recently activated application



Display the application in the header of the split display.

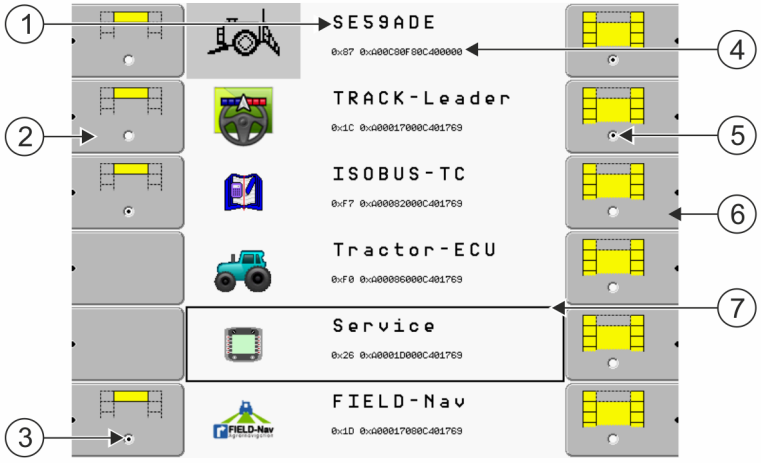


Display the application in the main section of the display.

6.1 Display layout in the selection menu

The display is split into the following sections:

- Function icons – left and right
- Applications section – in the middle, between the function icons.



Sections in the selection menu

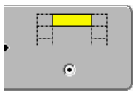
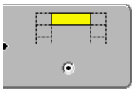
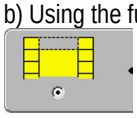
1	Name of an application	4	ISO ID of the application ISO name of the application
2	Function icons on the left Select an application which will later be displayed in the header.	5	Selection The selected application is displayed on the main display.
3	Selection The selected application is displayed in the header	6	Function icons on the right Open an application on the main display.
		7	Cursor Open the selected application using the rotary knob.

6.2 Opening applications

You can perform the following actions in the selection menu:

- Open an application.
- Display an application in the header of the split display.

Procedure

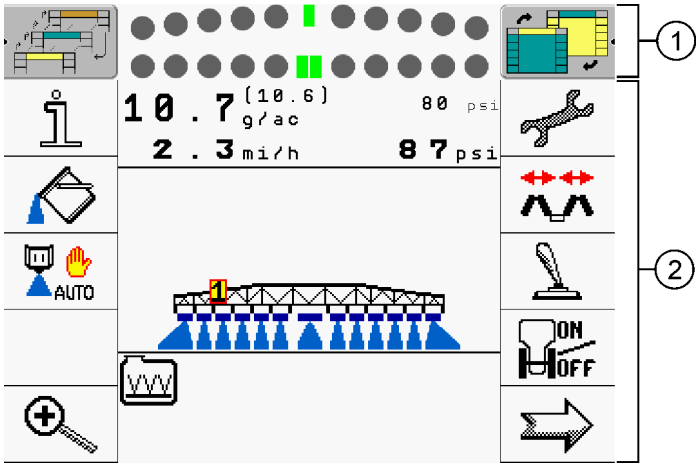
1.  - Set which application is to be displayed in the header of the split display.
   ⇨ The function icon of the selected application is marked with a dot on the left hand side:
   
2. Start the application for the main display. There are several ways to do so:
   a) With the rotary knob:
   - Select the desired application
   - Open the selected application
   b) Using the function keys on the right hand side:
    - Display the application shown next to the function icon.

⇨ Both applications will appear on the display.

6.3 Segmentation of the display

The display of the display is split into two sections.

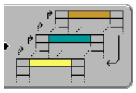
A different application is displayed in each section. This allows you, for example, to control the tractor on the field and monitor the field sprayer at the same time. This means that you will not need an additional display.

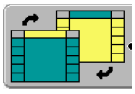


Segmentation of the display

1	Header – informative section. The header allows you to display information from an application.	2	Main screen – section used for control. The main display shows the application currently running, function icons and the information you need to control the application that is currently running.

In the selection menu you can see which applications can be run with the split display.

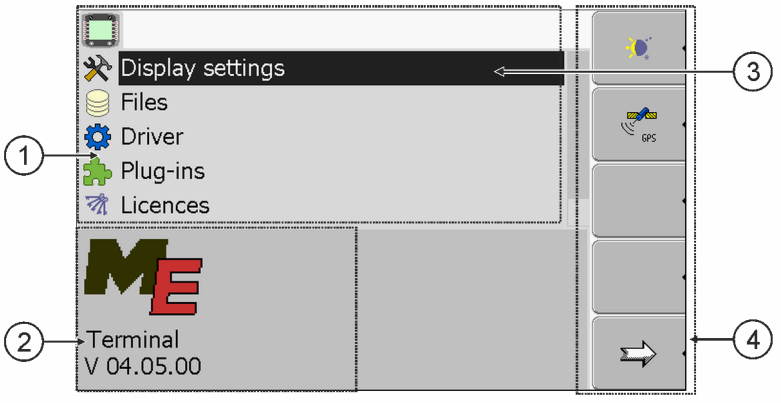
Function icon	Function
	Switch applications in the header section.

Function icon	Function
	Swap applications between the header section and the main section of the display.

7 Configuring the display in the Service application

Use the "Service" application to set up the display and enable the connected equipment.

Once you have launched the "Service" application, you will be shown the following screen:



Start screen of the "Service" application

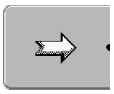
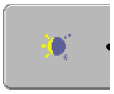
1	Main section Screen contents	3	Cursor Selects a line that can be clicked on with the rotary knob.
2	Version number Name of the display and version of the installed software	4	Function icons section Icons that can be pressed on this screen.

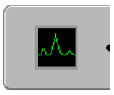
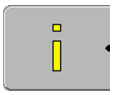
7.1 Controls in the Service application

The Service application is controlled using the rotary knob and the function buttons.

Controls

Some of the function icons explained here will only appear if a specific function is activated. This limits the information shown on the display to just the information that you need for your work.

Function icon	Meaning	Appears only if...
	Next page	There is one more page with function icons.
	Back	
	Activate day mode	
	Activate night mode	
	File cannot be deleted (gray)	Selected object cannot be deleted
	Delete file (red)	Selected object can be deleted

Function icon	Meaning	Appears only if...
	Configuring the GPS receiver	GPS receiver is activated
	Configuring farmpilot	farmpilot portal is activated
	Open the Diagnostics screen	Diagnostics is activated
	Retrieve default values.	
	Display DGPS connection status	
	Associating the buttons on a joystick with functions	Driver "Auxiliary2" is activated

7.2 Icons in the Service application

You will find the following icons in the Service application.

Icons

Function is activated

Function is deactivated

7.3 Changing the language

When you switch on the display for the first time, the text may appear in a foreign language (in German).

If you change the language in the Service application, you also change the language for all applications and the ISOBUS job computer.

If a connected ISOBUS job computer cannot activate the selected language, a standard language will be activated.

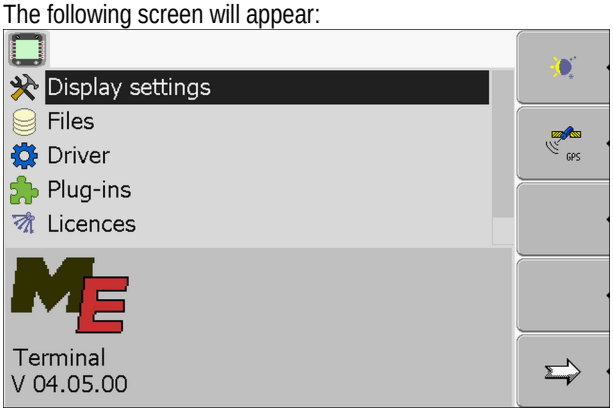
Procedure

1. - Switch on the display.
2. - Press.

⇨ The following screen will appear:

3. - Click on "Service".

⇨ The following screen will appear:



The texts on this screen may appear in a foreign language.

4. - Click on "Terminal-Einstellungen" ("Display settings").
5. - Click on "Sprache" ("Language").
6. - Select the abbreviation of your language.
7. - Press.

⇨ The following message will appear: "Restart the terminal."

8. - Press.

⇨ The language in the "Service" application will be changed. Language will be changed in other application only after a display restart.

9. - Restart display.

⇨ The language in other applications will be changed.

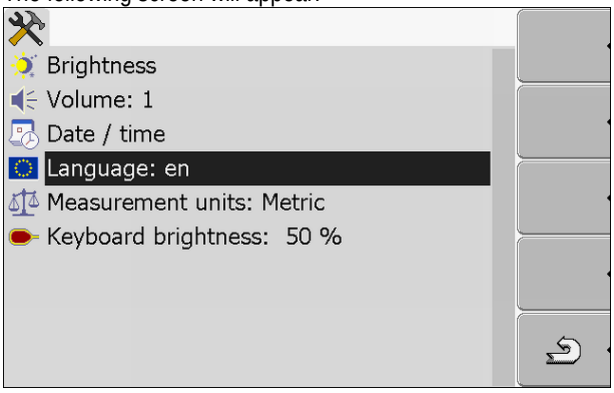
7.4 Configuring the basic display settings

The basic display settings can be adjusted on the "Display settings" screen.

Procedure

1. Switch to the "Display settings" screen:
   | Service | Display settings

⇨ The following screen will appear:



2. - Change the desired parameter.

List of parameters

Parameter	Sub-parameter	Meaning
Brightness	Day	Adjusting brightness for day mode
	Night	Adjusting brightness for night mode
	Night mode	Switching night mode on and off 0 = day mode is activated 1 = night mode is activated
Volume		Adjust volume
Date / time	Date	Setting current date
	Time	Setting current time
	Time zone	0 = Time zone: Greenwich Mean Time (GMT) 1 = GMT +1 hour (Germany) -1 = GMT -1 hour
Language		Selecting language
Measurement units	Metric	Displays all units in metrical system
	Imperial	Displays all units in imperial system
	US	Displays all units in US system
Keyboard brightness		Setting the level of keyboard brightness in percent

7.5 GPS Receiver

When you connect a GPS Receiver to the display, you must activate and configure it.

7.5.1 Activating the GPS Receiver

In order to activate the GPS Receiver, you must first activate its driver.

A driver is a small program that controls connected farm equipment. The drivers for the farm equipment supplied by Mueller-Electronics are pre-installed on the display.

Available drivers

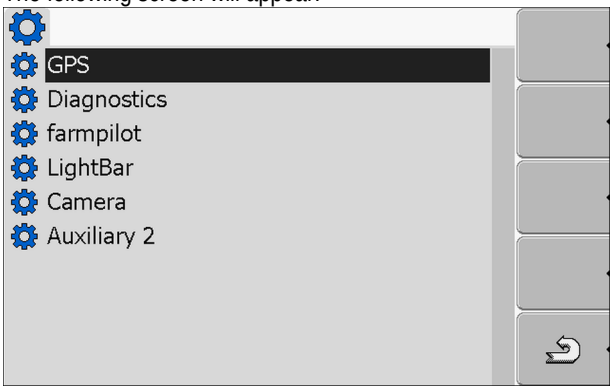
Driver name	GPS receiver
disabled	No GPS receiver
GPS_PSRCAN	Select this driver if a GPS receiver is connected to the job computer for the automatic steering. The signals are transmitted via the CAN cable to the display.
GPS_A100	Driver for the Mueller-Electronics A100 GPS receiver. Connected to the serial interface.
GPS_STD	Driver for unknown GPS receivers. Connected to the serial interface. This driver is activated by default. The connected GPS receiver cannot thus be configured.
GPS_NovAtel	Do not use.

⚠ CAUTION

Incorrect driver
Damage to the GPS receiver.

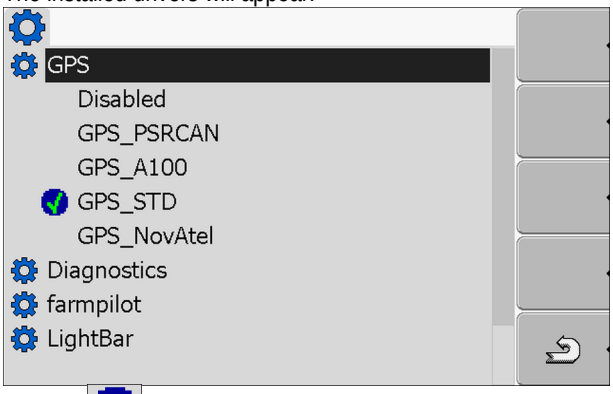
- Before connecting a GPS receiver to the display, you must always activate the appropriate driver.

Procedure

1. Switch to the "Driver" screen:
   | Service | Driver
   ⇨ The following screen will appear:
   

2. Select "GPS".
3. Click on "GPS".

⇨ The installed drivers will appear.



⇨ The icon appears beside the active driver.

4. Mark the line with the correct driver.
5. Click on the selected line.
   ⇨ The following icon will appear next to the driver
6. - Restart the display.
   ⇨ The GPS receiver is activated.
   ⇨ The following function icon will appear in the start screen of the "Service" application:

⇨ You have activated the GPS receiver.

7.5.2 Configuring the GPS receiver

Parameter

Use the following parameters to configure the GPS receiver:

Baud rate

Setting for the speed at which the display sends data to the DGPS Receiver. The parameter sets the baud rate for the display.

Satellite 1 and Satellite 2

Satellite 1 – primary DGPS satellite. The DGPS receiver will connect to this satellite in the first instance.

Satellite 2 – secondary DGPS satellite. The DGPS receiver will only connect to this satellite in the event that the primary satellite fails.

Your satellite selection will depend on which satellite currently has the best availability in your region.

Potential values:

- "Auto"
  The software automatically selects the current best satellite. This setting is not recommended, as it slows down start-up of the DGPS receiver.
- Name of the satellite. Which satellites are shown here is dependent on the driver and correction signal that you have activated.

Steering

This parameter activates the "Automatic steering" assistance function in the GPS Receiver.

Potential values:

- „On“
  Activates automatic steering assistance.
- "Off"
  Deactivates automatic steering assistance.

Correction signal

Type of correction signal for the DGPS receiver.

The correction signals which are available is dependent on the activated driver.

Potential values:

- For the "GPS_A100" driver:
  - "WAAS/EGNOS"

    Correction signal for Europe, North America, Russia and Japan.
  - "E-DIF"

    Internal calculation of correction data.

    This setting is required outside of the EU and the USA.

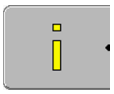
    To use e-Dif, you will require a special version of the DGPS receiver A100. You can order this this DGPS receiver from Mueller-Electronics with the item number 30302464.
- For the "GPS_NovAtel" driver
  - "EGNOS-EU"
  - "WAAS-US"
  - "MSAS-JP"
  - "GL1DE"

Terrain compensation

Under this parameter the terrain compensation GPS TILT-Module is configured.

You can order the terraín compensation from Mueller-Electronics with the following item number: 30302495.

Controls

Function icon	Function
	Reset the configuration of the DGPS receiver to default values
	Display DGPS connection status

Procedure

You can configure the parameter as follows:

☑ A GPS receiver is connected to socket C of the display.

☑ The appropriate driver is activated.

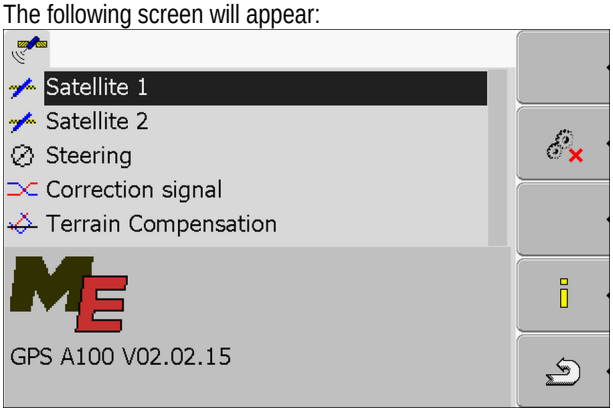
☑ The driver of the "LightBar_ME" external LightBar is deactivated. Otherwise the DGPS receiver cannot be configured.

☑ The external LightBar is not connected.

1. Switch to the "GPS" screen:

   | Service |

   ⇨ The following screen will appear:

2. - Click on the desired parameter. First of all, set the "Correction signal" parameter.

   ⇨ A selection list will appear.

3. - Click on the desired value.

   ⇨ The icon appears beside the value.

4. - Back.

   ⇨ For some parameters is it necessary to restart the display. In these cases, the following notification will appear:
   "Restart the display."

⇨ You have configured the DGPS receiver.

7.6 Configuring the "GPS TILT-Module" terrain compensation

Procedure

☑ The "GPS TILT-Module" terrain compensation is connected.

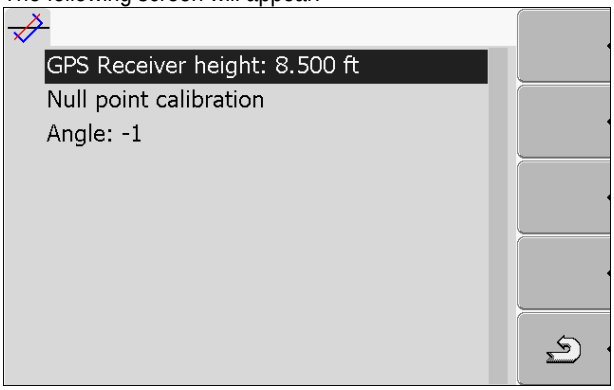
☑ The driver of the external LightBar is deactivated.

☑ The external LightBar is not connected.

1. Measure the distance between the GPS Receiver and the ground surface.
2. Switch on the display.
3. Switch to the configuration screen of the terrain compensation:

   | Service | | Terrain compensation

⇨ The following screen will appear:



4. Enter the distance between the GPS Receiver and the ground surface in the line "GPS Receiver height".
5. Position the tractor on a ground surface that is known to be level.
6. Click on the line "Null point calibration".
   ⇨ The position of the terrain compensation on an even surface is being calibrated.

⇨ After calibration the angle 0 will appear in the line 'angle'. The angle displayed changes every time the tractor tilts.

7.7 Activating an external LightBar

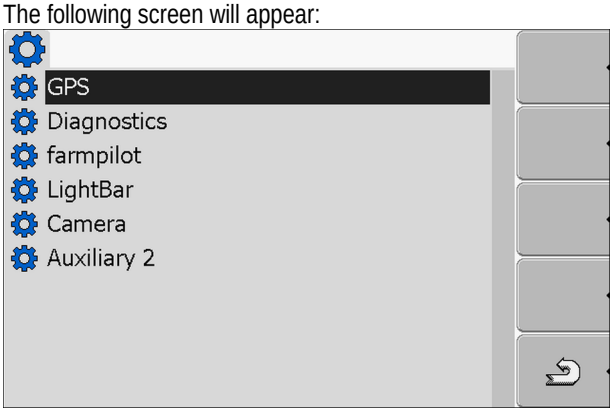
If you connected an external LightBar to the display, you must activate it.

To activate the external LightBar, you must first activate its driver.

You can order the external LightBar from Mueller-Electronics with the following item number: 30302490.

Procedure

1. Switch to screen "Driver":
   | Service | Driver
   ⇨ The following screen will appear:



2. Click on "LightBar".
   ⇨ The installed drivers will appear.
3. Click on the "LightBar_ME" driver.
   ⇨ Next to the driver the icon will appear.
4. - Restart display.

⇨ You have activated the external LightBar.

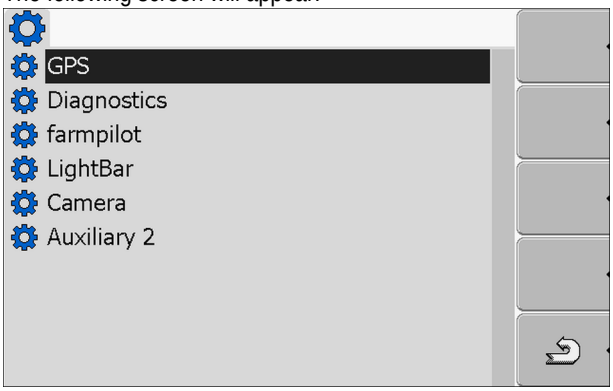
7.8 Camera

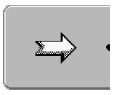
7.8.1 Activating a camera

If you have connected a camera or camera system to the display, you must activate it.

To activate a camera or a camera system, you must first activate its driver.

Procedure

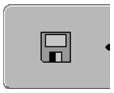
1. Switch to the "Driver" screen:
   | Service | Driver
   ⇨ The following screen will appear:
   

2. Click on "Camera".
3. Click on the "Camera_ME" driver.
   ⇨ Next to the driver the icon will appear.
4. - Restart display.
   ⇨ The following function icon will appear on the start screen of the "Service" application:
   
5. You have activated the camera driver.

7.8.2 Operating the camera

Controls

Function icon	Meaning
	Switching between several cameras.
	Rotating image.
	Zooming in for camera images.
	Zooming out for camera images.

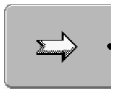
Function icon	Meaning
	Activating automatic camera mode. In automatic mode the camera images will be automatically displayed if a sensor sends a signal to do so. This only works if the vehicle is equipped with a suitable sensor.
	Saving camera settings.
	Exiting camera.

You can press the function keys even if the camera is set to full screen mode.

Procedure

☑ You have connected and activated the camera.

1. Switch to the "Camera" screen:

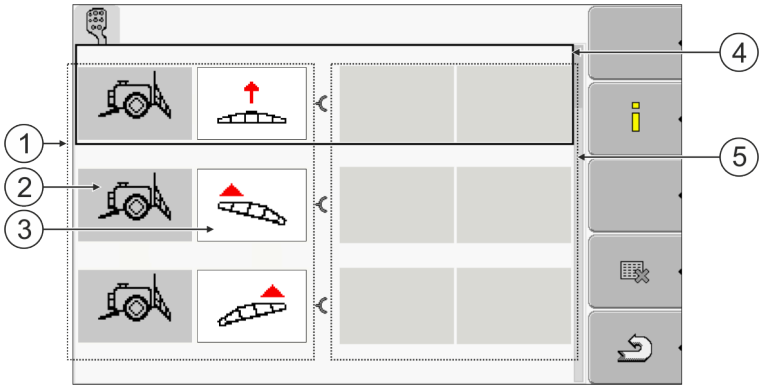
| Service |  |

⇨ The following screen will appear

2. Use the function keys to control the camera.

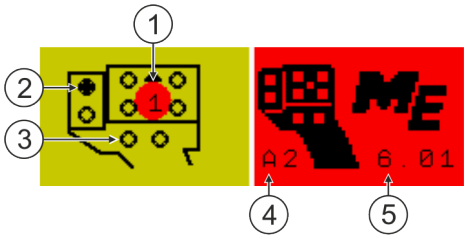
7.9 Configuring the joystick button allocations

The display offers you the possibility of assigning the functions of a ISOBUS job computer to the buttons of the joystick.



Selecting the function

1	Area with available functions	4	Cursor
2	Icon for the ISOBUS job computer	5	Button assignment area
3	Icon for the function		



Button assignment. The example of the Mueller-Electronics multi-function grip (MFG)

1	LED color (position of the side-switch on the multi-function grip)	4	Multi-function grip version
2	Button to which a function is assigned	5	Multi-function grip software version
3	Other buttons		

Function icon	Meaning
	Version information
	Deletes all assignments
	Deletes the marked assignment
	Confirms all assignments

Procedure

To activate the driver for this function:

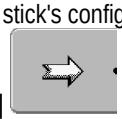
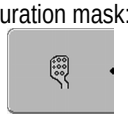
1. Switch to the "Driver" screen:
   | Service | Driver
2. Activate the value "Auxiliary2" in driver "Auxiliary 2".
3. - Restart the display.

Procedure

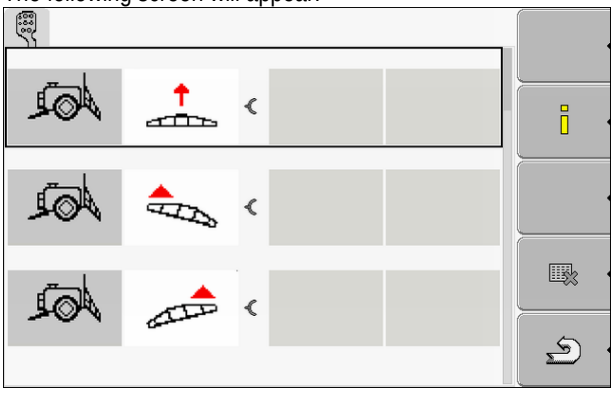
To configure the button assignment:

☑ The joystick and ISOBUS job computer are connected and support the "Auxiliary 2" protocol.

☑ You have activated the driver "Auxiliary2"

1. To switch to the joy stick's configuration mask:
    | Service |  | 

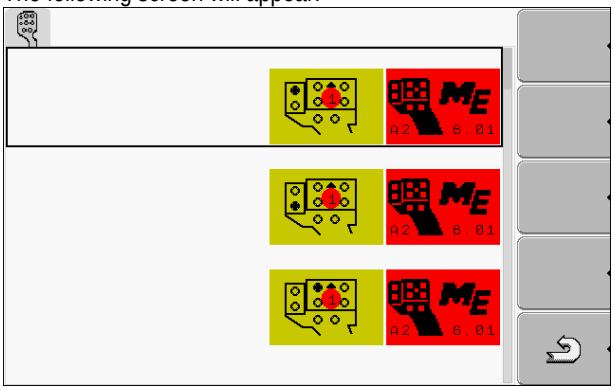
⇨ The following screen will appear:



⇨ The icons which appear here will be dependent on the software of the connected ISOBUS job computer. This is only an example.

2. - Select the function which you wish to assign to a button.

⇨ The following screen will appear:



⇨ The content of the screen will depend on the software of the connected joystick.

3. Select the button to which you want to assign the selected function. This is only an example.
4. - Leave screen.
5. - Restart the display.
   ⇨ After restarting, a screen with an overview of the assignments appears.
   ⇨ If this screen does not appear, open the Service application.
6. Confirm the notification "Scroll to the end."
7. Scroll with the knob all the way to the bottom of the list.

   ⇨ The following icon will appear in green on the right-hand side:
8. - Confirm the assignments. You must re-confirm the assignments after each restart.

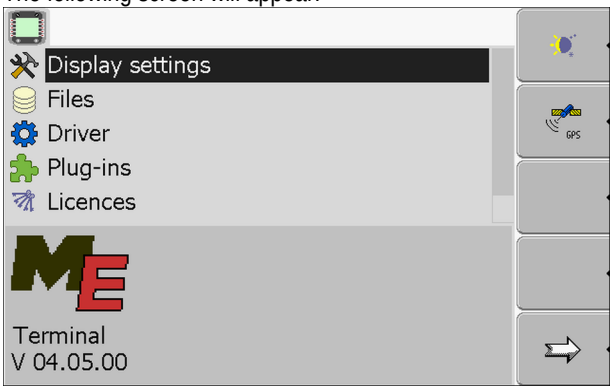
⇨ You have completed the assignments and can now operate the machine with the joystick.

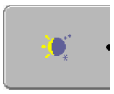
7.10 Adjusting the brightness for day or night mode

In this chapter you will learn how to adjust the brightness of the display for day or night mode.

Procedure

1. Open the "Service" application:
   | Service
   ⇨ The following screen will appear:



2. Change the operating mode.
   Depending on which operating mode is currently active, you can use one of the function icons:
   – Activate day mode.
    – Activate night mode.

⇨ The brightness of the display will be adjusted immediately.

7.11 Activating and deactivating applications

In the "Service" application you can activate and deactivate other applications that are installed on the display.

The applications are installed in packages, in so-called plugins. A plugin can contain several applications.

You can for example deactivate a plugin if you do not want to use it. Then the plugin will not be displayed in the selection menu.

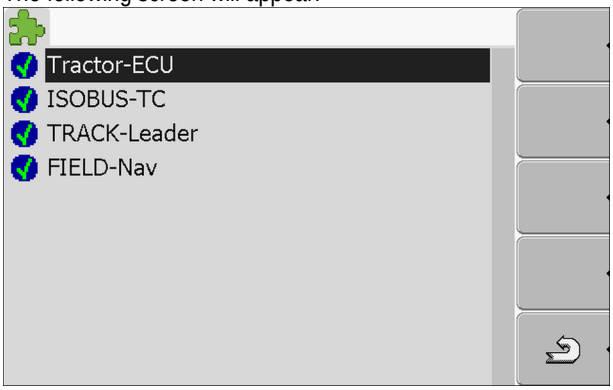
Name of the plug-in	Includes the following applications
Tractor-ECU	Tractor-ECU
ISOBUS-TC	ISOBUS-TC
TRACK-Leader	TRACK-Leader SECTION-Control TRACK-Leader TOP VARIABLE RATE-Control
FIELD-Nav	FIELD-Nav

Procedure

To activate and deactivate plug-ins:

1. Switch to the "Plug-ins" screen:
   | Service | Plug-ins

⇨ The following screen will appear:



2. - Click on the desired plugin.
   ⇨ The icon preceding the name of the plugin indicates whether the plugin is activated or deactivated.
3. - Exit screen.
   ⇨ The following notification will appear:
   "Restart the terminal."
4. - Confirm.
5. - Restart display.

⇨ All activated plugins will appear in the selection menu.

7.12 Activating licenses for full versions of the software

Several applications are pre-installed on the display, which you can use for trial purposes for up to 50 hours. [➞ 9] After this time has elapsed, they will be automatically deactivated. The amount of free usage time remaining is shown in brackets next to the name of the application.

This menu does not appear on displays with hardware version 1.4.1. In the TRACK-Leader application, licenses are activated in the "Information" screen.

To activate a license you will require an activation number, which you will receive on purchasing an application from Mueller-Electronics. If you request the activation number by phone or by email, you will be required to give our staff the following information:

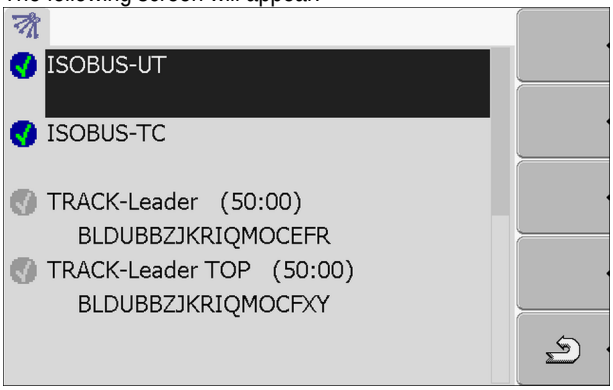
- Code – Found under the name of the application on the "License management" screen.
- Serial number of the display – Found on the nameplate on the reverse of the display.
- Item number of the display – Found on the nameplate on the reverse of the display.

Procedure

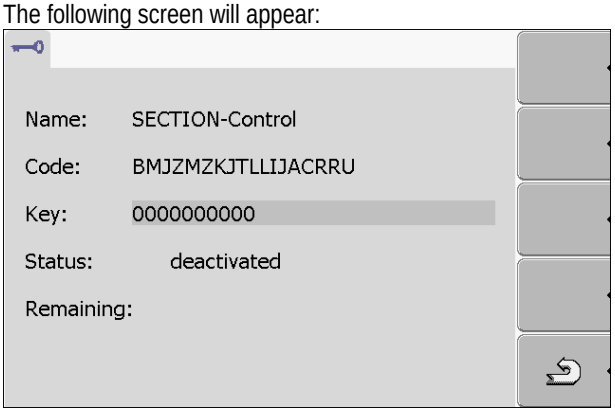
The activation number is entered as follows:

1. Switch to the "Licenses" screen:
   | Service | Licenses

⇨ The following screen will appear:



2. Click on the desired application.
   ⇨ The following screen will appear:



3. Enter the activation number in the "Key" field. You will receive the activation number on purchasing a software license.
4. Confirm
   ⇨ The following icon will appear next to the application on the "Licenses" screen:

⇨ The application is activated. You can use the application without any restrictions.

7.13 Setting the purpose of the display

If you use more than one display, you can decide how you want to use this display.

The following options are available to you:

- "Login as ISOBUS-UT"
  Activate this parameter if you want the ISOBUS job computer to be displayed on the display. This parameter must be activated in most instances. On very few self-propelled agricultural machines, the parameter must be deactivated.
- "Run as auxiliary terminal"
  The ISOBUS job computer does not log into displays which log in as "auxiliary display".

Procedure

1. To switch to the "Display configuration" screen:
   | Service | Display configuration
2. Configure parameter.

7.14 Deleting files from the USB flash drive

NOTICE

Potential loss of data!
Deleted files cannot be retrieved!

- Think very carefully about which file you wish to delete.

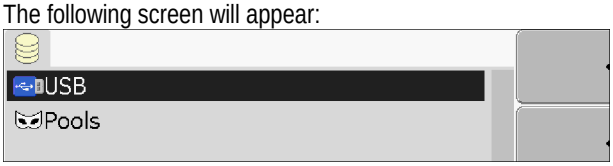
On the "Files" screen you can delete files from the USB flash drive.

The "Files" screen only displays files that are stored in either of the following two folders on the USB flash drive:

- Screencopy – contains all screenshots you have created
- Taskdata – contains all task data for the "ISOBUS-TC" application

Procedure

1. Switch to the "Files" screen:
   | Service | Files
   ⇨ The following screen will appear:



2. Click on "USB".
   ⇨ The "Screencopy" and "Taskdata" folders will appear.
   ⇨ If these folders fail to appear, it is because you did not create them on the USB flash drive.
3. Click on the desired folder.
   ⇨ The contents of the folder will be displayed.
   A folder may either contain files or further folders.
   If nothing is displayed, the folder is empty.
4. Select the files to be deleted.
5. – Delete file (red)

⇨ Deleting file.

7.15 Deleting pools

You can delete the pools to speed up the display's operation.

Pools are the intermediate storage for the display. Pools are used to temporarily store graphics or text. Over time, the pools will become too large and slow down the operation of the display.

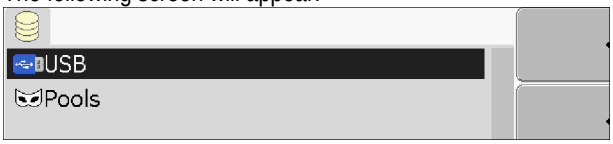
When to delete?

- After updating the software of a connected jobcomputer.
- If the display operates more slowly than usual.
- When asked to do so by Customer Services.

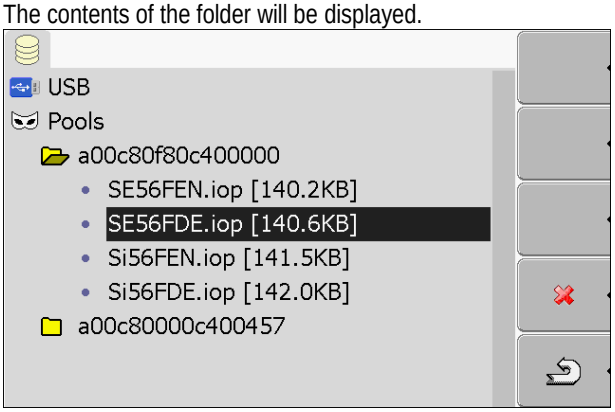
Procedure

1. Switch to the "Files" screen:
   | Service | Files

⇨ The following screen will appear:



2. Click on "Pools".
   ⇨ The names of several folders will appear.
   ⇨ If the pool is empty, nothing will appear.
3. Click on the desired folder.
   ⇨ The contents of the folder will be displayed.



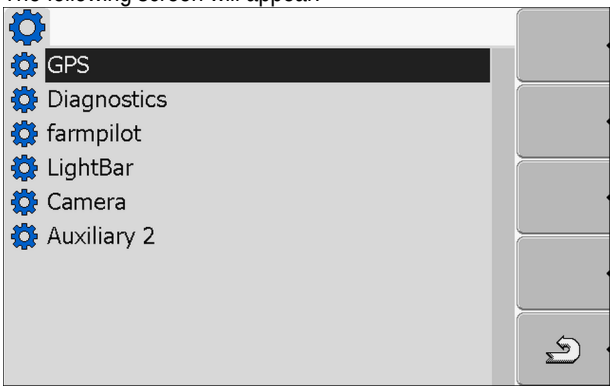
   The names of the folders are the ISO IDs of the applications whose temporary data they store.
4. Select the desired file.
5. - Delete file.
   ⇨ Deleting file.
6. - Restart display.

7.16 Activating the "Diagnostics" function

To activate the "Diagnostics" function, you must first activate its driver.

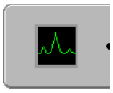
Procedure

1. Switch to the "Driver" screen:
   | Service | Driver
   ⇨ The following screen will appear:



2. Click on "Diagnostics".
3. Click on the "DiagnosticsServices" driver.

⇨ Next to the driver the icon will appear.

4. - Restart display.
   ⇨ The following function icon will appear on the start screen of the "Service" application:
   

⇨ You have activated the "Diagnostics" function.

7.16.1 Jobcomputer diagnostics

The screen "Jobcomputer diagnosis" contains a variety of information that is primarily important to Customer Services. Customer Services can use this screen to determine which versions of the hardware and software are installed on your display. This will speed up the diagnostic process if errors arise.

7.17 Screenshots

A photo of the screen beeing displayed.

If an error occurs when you are using the display, Customer Services may ask you to capture a screenshot.

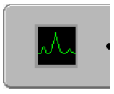
A screenshot can be:

- emailed to Customer Services.
- sent to the farmpilot portal (provided you have activated the farmpilot portal)

7.17.1 Configuring the screenshots function

Procedure

☑ You have activated the "Diagnostics" function. [➞ 42]

1. Start the "Service" application:
   | Service |
2.  – Open the "Diagnostics" screen.
3. Click on "Screenshot Settings".
4. Click on "Activate screenshots".
   ⇨ The status of the function is displayed on the icon:
   - Function activated
   - Function deactivated
5. Click on "Storage location".
   ⇨ The line will be highlighted with a frame.
6. Select "USB" to save screenshots on the USB flash drive.
7. Select "Portal" to send screenshots to the farmpilot portal.

7.17.2 Creating screenshots

Procedure

☑ You have configured the "Screenshots" function.

☑ If you want to save the screenshots to the USB flash drive, you will already have inserted the USB flash drive into the display.

1. Open any screen.
2. Press the following buttons in the order displayed and keep them pressed for a short while:

   (on older displays you need to press the buttons in reversed order)
   ⇨ While the screenshot is being captured, the icon of a photo camera will be displayed in the center of the display:

⇨ When the camera icon disappears, the screenshot has been created.

⇨ You will find the screenshot you captured in the location you specified as the "Storage location". The USB flash drive saves the screenshots in the folder "ScreenCopy".

7.18 CAN-Trace settings

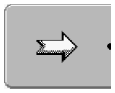
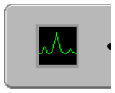
CAN-Trace is a function that logs the data exchange between the display and the connected jobcomputers. Customer Services can use the logged data for diagnostic purposes should any errors arise in the system.

If an error occurs when using the display, Customer Services may ask you to activate the CAN-Trace function.

Only activate this function if prompted to do so by Customer Services.

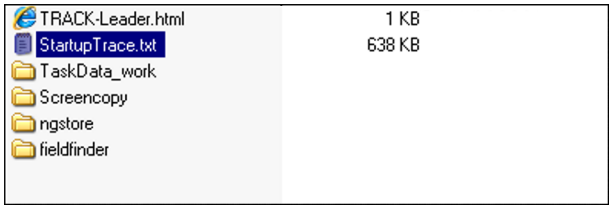
Procedure

1. Switch to the "CAN-Trace settings" screen:

| Service |  |  | CAN-Trace settings

1. Click on "Duration (min.)".
2. Set the duration. Specify for how long communication should be logged after the display has been restarted. Communication can be logged for a duration of one to five minutes.
3. Click on "Storage location".
4. Select the storage location.
5. Select "USB" to save data on the USB flash drive. The USB flash drive must be inserted in the display.
6. Select "Portal" to send data to the farmpilot portal. farmpilot must be activated before data can be transferred.
7. Click on "Activate CAN-Trace".
   ⇨ The status of the function is displayed on the icon.
   ⇨ The icon must appear next to "Activate CAN-Trace".

8. - Restart display.
   ⇨ After restarting the display, CAN-Trace will log the communication between the display and the jobcomputer.
9. Leave the display switched on until the set CAN-Trace duration has elapsed.
   ⇨ The CAN-Trace function will be deactivated automatically.
10. If you specified USB as the storage location, verify that the file "StartupTrace.txt" exists on the USB flash drive:



11. If this file is missing, you must run the CAN-Trace function again.
12. Email the "StartupTrace.txt" file to Customer Services. If you chose "Portal" as the storage location, this file will have been sent automatically.

7.19 Configuring farmpilot

farmpilot is an internet portal which allows software on a farm computer to exchange data with machines via a mobile phone network. Operating data is stored in a central location on the portal and is presented clearly to the user.

Before you can use farmpilot in conjunction with your display, you must complete the following steps:

- Purchase a SIM card and have it activated.
- Activating farmpilot
- Enter your farmpilot access data

Refer to the following chapters to learn how to perform these steps.

7.19.1 Activating farmpilot

To activate farmpilot on your display, you must first activate its driver.

NOTICE

High costs from prolonged data transfer

If you do not have a flatrate in your mobile phone contract, continuous use of farmpilot can lead to high costs.

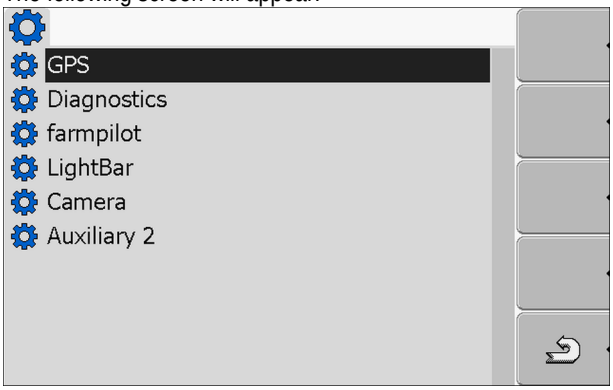
If your flatrate has a data volume limit, continuous use of farmpilot can quickly use up your data volume limit.

- Deactivate the farmpilot driver, when you are not using the portal.

Procedure

1. Switch to the "Driver" screen:
   | Service | Driver

⇨ The following screen will appear:



2. Click on "farmpilot".
3. Click on the "TPD" driver.
   ⇨ Next to the driver the icon will appear.
4. - Restart display.
   ⇨ The following function icon will appear on the start screen of the "Service" application:

⇨ You have activated the farmpilot portal.

You must now enter the access data for the farmpilot portal.

7.19.2 Configuring the connection with farmpilot

Before you can connect the display to farmpilot, you must configure the connection.

You will receive this data when purchasing the farmpilot access data.

Parameter

You will require the following parameters for the configuration:

Username

Username for farmpilot.

Password

Password for farmpilot.

Provider

Opens a screen where the GPRS connection can be configured.

With most mobile phone providers, this configuration occurs automatically.

If the access data for the GPRS connection differ with your provider, you can configure the connection manually.

You can find precise instructions in the chapter:

Configuring the GPRS connection manually [➞ 47]

Server

Server address

The server address cannot be altered.

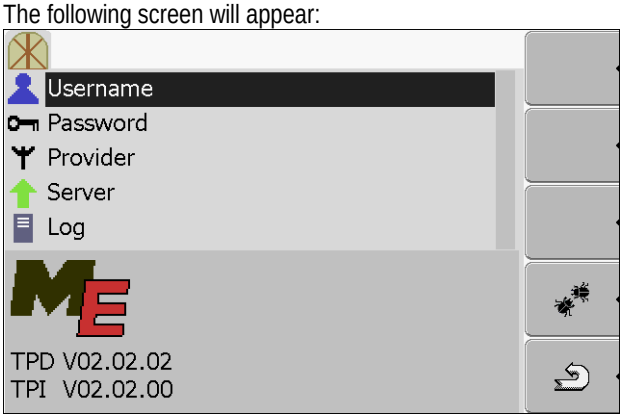
Log

Switches logging ON and OFF.

Switch on logging only when prompted to do so by Customer Services.

Procedure

1. Open the "Service" application:
   | Service
2. - Open the access data screen for farmpilot.
   ⇨ The following screen will appear:



3. Click on the line with the desired parameter.
4. Configure parameter.

7.19.3 Configuring the GPRS connection manually

In this chapter you will learn how to configure the GPRS connection manually.

With most SIM cards, the GPRS connection will be configured automatically.

The GPRS connection must be manually configured in the following instances:

- You have bought a new SIM card. The display does not recognise your mobile phone provider.
- Your mobile phone provider has altered the access data for the GPRS connection.

Parameter

The values you must enter for the parameters, depend on your mobile phone provider. You can find out these data from your mobile phone provider.

You will require the following parameters for the configuration:

Country

Country for which the SIM card is configured. Cannot be altered.

Provider

Name of the mobile phone provider. Appears automatically.

With unrecognised cards, you can enter the name of the mobile phone provider yourself.

APN

Abbreviation of "Acces Point Name“.

Address of the GPRS access point.

DNS 1 and DNS 2

Abbreviation of "Domain Name System“.

IP addresses of the first and second DNS servers

Number

Dialling code for the modem. Cannot be altered.

Username

Username for the GPRS connection.

Password

Password for the GPRS connection.

Controls

Function icon	Function
	Retrieve default values.

Procedure

You can configure the mobile connection as follows:

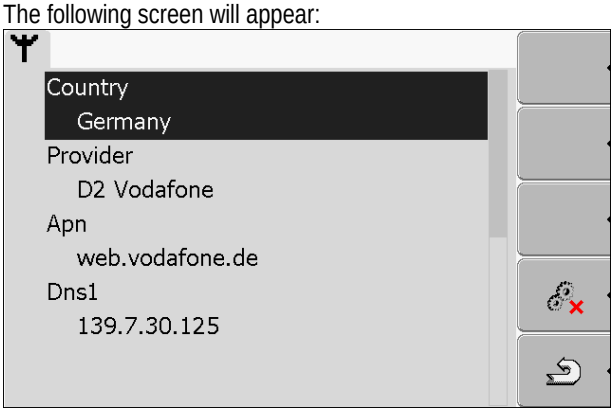
☑ You have inserted the SIM card.

☑ You have activated the farmpilot portal.

1. Switch to the configuration screen for the GPRS connection:

| Provider

⇨ The following screen will appear:



2. Set GPRS connection parameters.

7.19.4 Sending diagnostic data to the portal

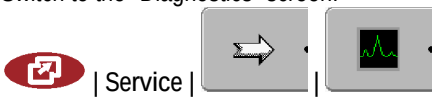
Customer Services may ask you to send diagnostic data to the portal. This allows Customer Services to gather detailed information about your display and therefore examine it more thoroughly.

Procedure

☑ You have activated the "Diagnostics" function.

☑ You have activated the farmpilot portal.

1. Switch to the "Diagnostics" screen:

 | Service | | Diagnostics

2. - Send diagnostic data.

⇨ The following notification will appear:
“DeviceidentData transfer“
⇨ The data is being uploaded to the portal.

3. Wait until the "Sending DeviceIdentData" notification disappears.
⇨ The data have been uploaded to the portal.
4. If the process is taking too long, you can cancel the data transfer.
5. - Cancel data transfer.

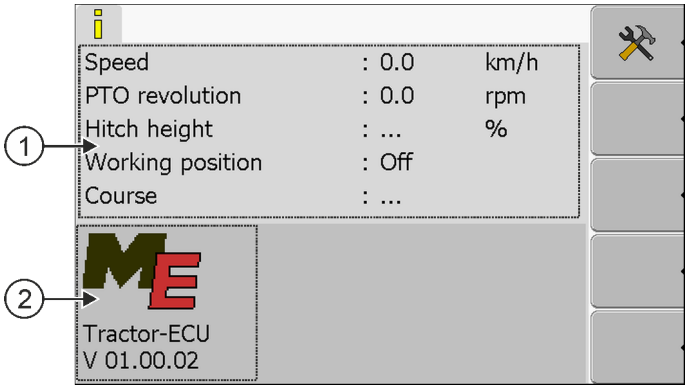
8 Tractor-ECU application

The Tractor-ECU application allows you to:

- Create a profile for each vehicle, with specific settings.
- Input the sensors which are mounted on the vehicle.
- Input the position of the GPS receiver.

If you are using a self-propelled machine, you can simply enter the position of the GPS receiver. [➙ 56]

After launching the Tractor-ECU application, the following screen will appear:



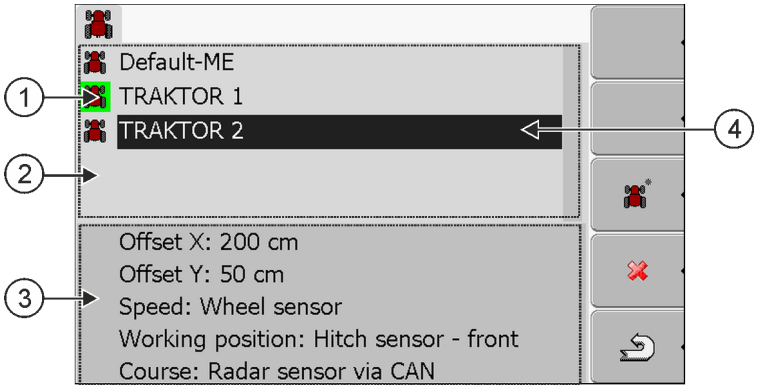
Tractor-ECU application start screen

1	**Main section** Displays the current parameters.	2	**Version number** Name of the application and version of the installed software

If the value "..." appears for a parameter on the screen, the relevant sensor is not connected.

Function icon	Meaning
	Calling up a list of vehicles

8.1 Adding a vehicle profile



List of vehicle profiles

1	Activated vehicle profile (the icon is marked in green)	3	Information on the marked vehicle profile
2	List of all available vehicle profiles	4	Cursor

Function icon	Meaning
	Add a vehicle profile
	Vehicle profile cannot be deleted
	Delete the vehicle profile
	Back

Procedure

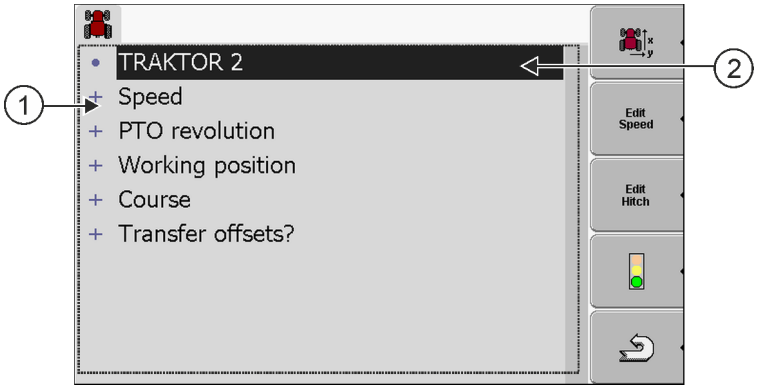
1. Call up the Tractor-ECU application:
   | Tractor-ECU
2. - Call up the vehicle list.
3. - Add a new vehicle profile.

⇨ A new vehicle profile appears on the screen.

⇨ You can now configure the parameters of the new vehicle profile.

8.2 Configuring the parameters for a vehicle profile

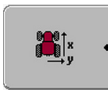
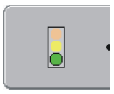
In a vehicle profile, you can set the sensors that you want to use.



1	List of parameters	2	Cursor

There are two ways to connect the sensors:

- The sensors are connected to the display [→ 15].
- The sensors are connected to an agricultural device, which is connected to the display via CAN. The data is transmitted from an external job computer or an external Tractor-ECU.

Function icon	Meaning	Only appears if...
	Switch to the "Settings" screen Enter the position of the GPS receiver [→ 56].	
	Activate the vehicle profile	The selected vehicle profile is not activated.
	Back	
	Calibrate the speed sensor	A wheel sensor or radar sensor is used for speed measurements. The sensor is connected to the display.
	Calibrate the working position sensor	A hitch sensor - front or a hitch sensor - rear is used to measure the working position. The sensor is connected to the display.

Procedure

1. Call up the Tractor-ECU application:
   | Tractor-ECU
2. - Call up the vehicle list.
3. Select the vehicle profile.
4. Change the desired parameters. You can also change the name of the vehicle profile.

Parameters in a vehicle profile

Only those parameters which you can use to configure the hardware version of your display are shown.

Speed

Configuring the speed sensor. This measures the speed.

Potential values:

- "disabled"
  No sensor measures the speed.
- "Wheel sensor"
  A wheel sensor is connected to the display. The wheel sensor must be calibrated [→ 54].
- "Radar sensor"
  A radar sensor is connected to the display. The radar sensor must be calibrated [→ 54].
- "GPS receiver"
  The speed is calculated using GPS.
- "Unknown sensor via CAN"

A wheel sensor or a radar sensor is connected to the display via CAN.
- "Radar sensor via CAN"
  A radar sensor is connected to the display via CAN.
- "Wheel sensor via CAN"
  A wheel sensor is connected to the display via CAN.

PTO revolution

Configuring the PTO (power take-off) revolution sensor. This measures the PTO revolutions.

Potential values:
- "disabled"
  No sensor measures the PTO revolutions.
- "Revol. sensor - front"
  A revolution sensor which is fitted onto the front PTO.
- "Revol. sensor - rear"
  A revolution sensor which is fitted onto the rear PTO.
- "targets/turn"
  Number of targets which the PTO transfers per revolution.

Working position

Configuring the working position sensor. This determines the working position.

Potential values:
- "disabled"
  No sensor measures the working position.
- "Hitch sensor - front"
  A working position sensor which is mounted on the front hoist. This is connected to the display. The working position sensor must be configured [➞ 55].
- "Hitch sensor - rear"
  A working position sensor which is mounted on the rear hoist. This is connected to the display. The working position sensor must be configured [➞ 55].
- "Unknown sensor via CAN"
  A working position sensor which is mounted on the front hoist or rear hoist. The working position sensor is connected to the display via CAN.
- "Front via CAN"
  A working position sensor is mounted on the front hoist. The working position sensor is connected to the display via CAN.
- "Rear via CAN"
  A working position sensor is mounted on the rear hoist. The working position sensor is connected to the display via CAN.

Course

Configuring the course sensor. This measures the course.

Potential values:
- "disabled"
  No sensor measures the course.
- "Unknown sensor via CAN"
  A wheel sensor or a radar sensor is connected to the display via CAN.

- "Radar sensor via CAN"
  A radar sensor is connected to the display via CAN.
- "Wheel sensor via CAN"
  A wheel sensor is connected to the display via CAN.
- "Course sensor"
  The course signal is transmitted to the display. Does not function if a working position sensor is connected to the display.
- "inversion"
  This parameter inverts the meaning of the signals. Only for use with the "Course sensor" parameter.

Transfer offsets?

This allows you to set how the position of the GPS receiver is transmitted to the SECTION-Control application.

Potential values:

- "Yes"
  The offsets are transferred.
- "No"
  The offsets are not transferred. Only select this setting when a ISOBUS-compatible tractor, which transmits the geometry of the tractor to the ISOBUS, is connected to the display.

8.2.1 Calibrating the speed sensor

When calibrating the speed sensor using the 328.085ft (100m) method, determine the number of targets which the speed sensor encounters over a distance of 328.085ft (100m).

If you know the number of targets for the speed sensor, you can also input this manually.

Procedure

☑ You have measured and marked a distance of 328.085ft (100m). The distance must correspond to the field conditions. You must therefore drive across a meadow or a field.

☑ The vehicle with the connected machine is operational for a 328.085ft (100m) drive and is at the start of the marked distance.

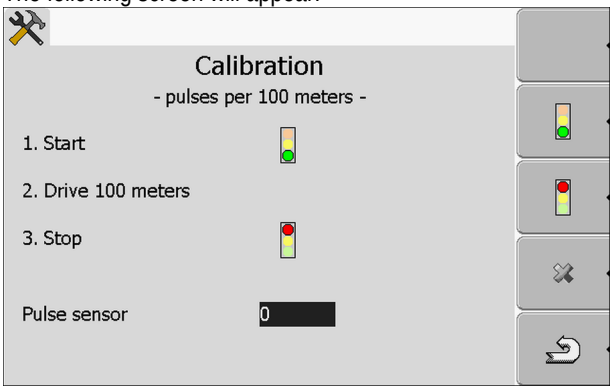
☑ You have connected a wheel sensor or radar sensor to the display.

☑ You have selected the value "Wheel sensor" or "Radar sensor" in the "Speed" parameter.

1. Call up the Tractor-ECU application:
   | Tractor-ECU
2. - Call up the vehicle list.
3. Select the vehicle profile.
4.

   - Press.

⇨ The following screen will appear:



5. When determining using the 328.085ft (100m) method: The action sequence is shown on the display (100m = 328.085ft).
   OR
   For manual input: - Input a value.
6. - Return to the vehicle profile.

⇨ You have calibrated the speed sensor.

8.2.2 Configuring a working position sensor

If you measure the working position using a working position sensor, you must configure the sensor before use.

During the configuration, you can choose between three types of sensor:

- "analog"
  You are using an analog working position sensor, which measures the height of the hitch linkage as a percentage.
- "digital"
  You are using a digital, ISO-compatible working position sensor in accordance with ISO 11786. The sensor is connected to the display via the signal socket.
- "ME-sensor Y"
  You use a working position sensor provided by Mueller-Electronics. The sensor is connected to the display.

Procedure

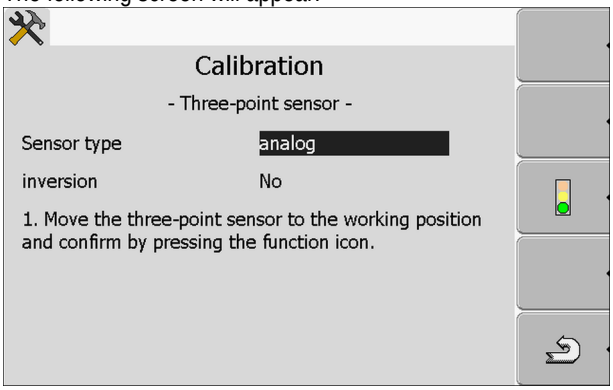
☑ You have connected a working position sensor directly to the display or via the signal socket to the display.

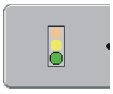
☑ You have selected the value "Hitch sensor - front" or "Hitch sensor - rear" in the "Working position" parameter.

1. Call up the Tractor-ECU application:
   | Tractor-ECU
2. - Call up the vehicle list.
3. Select the vehicle profile.
4.

- Press.

⇨ The following screen will appear:



5. Select a sensor type.
6. Select whether you want to invert the signal. Inversion only makes sense when you have selected "digital" or "ME-sensor Y".
7. If you have selected "digital" or "ME-sensor Y": - Return to the vehicle profile.
   OR
   if you have selected "analog": Move the hitch to the height at which the working position starts.
8.  - Press to confirm.
9. - Return to the vehicle profile.

⇨ You have configured the working position sensor.

8.2.3 Entering the position of the GPS Receiver

When you have mounted and connected the GPS receiver, you must enter its exact mounting position.

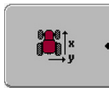
In order to enter an accurate position for the GPS Receiver, you must measure the distances of the GPS Receiver from the longitudinal axis and from the so-called attachment point [➞ 57].

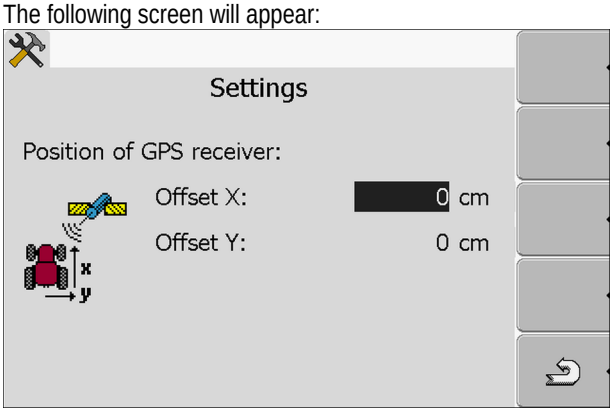
When entering distances, please note that it is essential to specify whether the GPS Receiver is to the left or right of the tractor's longitudinal axis and whether it is positioned before or after the attachment point.

What is the position of the GPS Receiver?	The distance should be entered as follows
to the right of the longitudinal axis	y
to the left of the longitudinal axis	- y
before the attachment point	x
after the attachment point	- x

Procedure

1. Call up the Tractor-ECU application:
   | Tractor-ECU

2. - Call up the vehicle list.
3. Select the vehicle profile.
4.  - Press.
   ⇨ The following screen will appear:

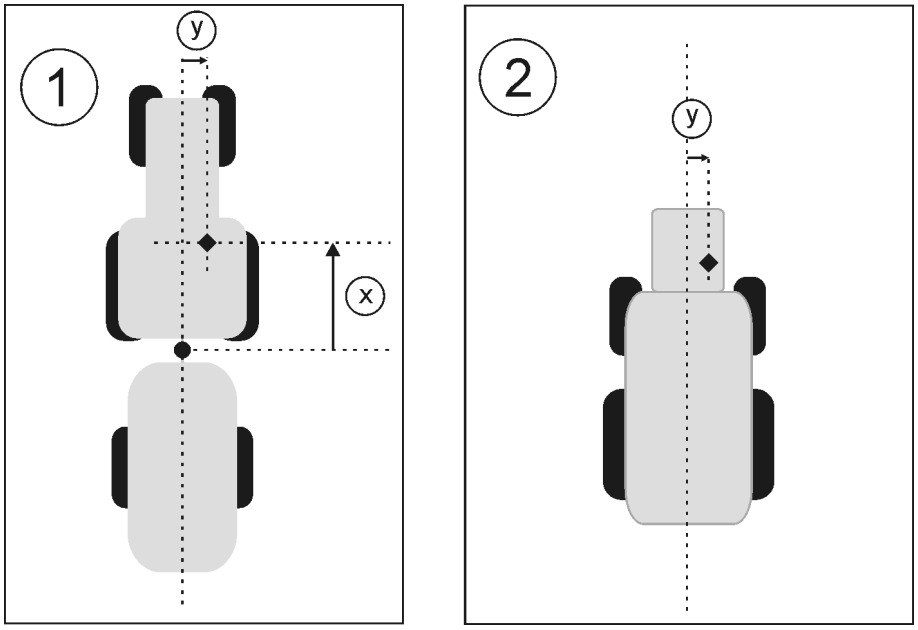


5. Measuring the position of the GPS receiver. You will find out how to do this in the following subchapters.
6. Input the measured distances in the "Offset X" and "Offset Y" fields.
7. - Return to the vehicle profile.

⇨ You have input the position of the GPS receiver for the selected vehicle profile.

For machines fitted with an ISOBUS job computer

On the following illustration distances are marked, which must be measured for each different machine.



GPS receiver for ISOBUS machines

●	Attachment point for attached or trailed implements	◆	GPS receiver
(1)	Attached or trailed implements	(2)	Self-propelled machines
y	Distance between the longitudinal axis and the GPS receiver for Offset Y	x	Distance for Offset X

Procedure

To determine the distances for tractors with an ISOBUS-job computer:

☑ The job computer of the implement in use is connected to the display

☑ In the job computer the geometry of the implement is configured.

1. Measure the distance between the attachment point of the attached or trailed implement and the GPS receiver.
2. Input the measured distance as parameter "Offset X".
3. Measure the distance between the longitudinal axis of the machine and the GPS receiver.
4. Input the measured distance as parameter "Offset Y".

Procedure

To determine the distances for self-propelled machines with an ISOBUS job computer:

☑ The job computer of the implement in use is connected to the display

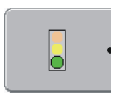
☑ In the job computer the geometry of the implement is configured.

1. Input 0 inch as parameter "Offset X".
2. Measure the distance between the longitudinal axis of the machine and the GPS receiver.
3. Input the measured distance as parameter "Offset Y".

8.3 Activating vehicle profiles

In order to work with the inserted parameters, you must activate the vehicle profile of the used vehicle.

Procedure

1. Call up the Tractor-ECU application:
   | Tractor-ECU
2. - Call up the vehicle list.
3. Select the vehicle profile.
4.  - Activate the vehicle profile.

9 ISOBUS-TC task processing

9.1 Adjusting how you use ISOBUS-TC

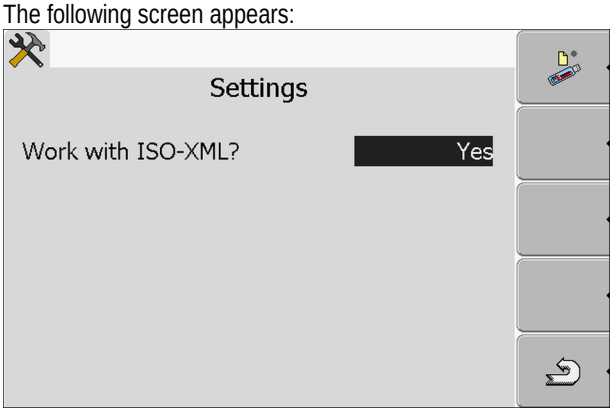
First of all, you must decide how you will use the ISOBUS-TC application. The operation of ISOBUS-TC and TRACK-Leader is dependent on this setting.

There are two scenarios in which you can use ISOBUS-TC. Use the "Work with ISO-XML?" parameter to set the scenario you will work with:

- "Yes"
  Select this setting if you set up tasks on your PC or if you want to set up tasks on the display.
  In this instance, you must always start a task before you start work. Only then does the data exchange between ISOBUS-TC, TRACK-Leader and the ISOBUS-job computer function.
  You will need a "ISOBUS-TC" license for this.
- "No"
  Select these setting if you do not use tasks. Instead, you use application maps in shp format or enter the application rates directly into the ISOBUS-job computer.
  In this instance, ISOBUS-TC only works in the background. You will not need a license for this.
  You can also skip the other sections of the instructions regarding ISOBUS-TC.

Procedure

You can change the mode of the "ISOBUS-TC" application as follows:

1. Change to "Settings" screen:
   | ISOBUS-TC |
   ⇨ The following screen appears:
   

2. - Select and click on the "Work with ISO-XML?" line.
   ⇨ The mode will change with each click.
3. Set the desired mode.
4. - Restart the display.

⇨ The set mode will be activated after restart.

10 Maintenance and servicing

NOTICE

This product does not contain any components which require maintenance or repair!
Never unscrew the casing!

10.1 Servicing and cleaning the display

- Press the keys with your fingertips. Avoid using your finger nails.
- Only clean the product with a soft, damp cloth.
- Only use clear water or glass cleaner.

10.2 Disposing of the unit

When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with applicable EU legislation.

10.3 Instructions on retrofitting

Instructions on how to retrofit electrical and electronic farm equipment and/or components

Agricultural equipment used today features electronic components and parts whose function can be affected by other farm equipment which emits electromagnetic waves. Such effects could lead to personnel being put in danger, if the following safety instructions are not adhered to.

Selecting components

When selecting components, make sure first of all that the retrofitted electrical and electronic components comply with the current version of the EMC Directive 2004/108/EC and carry the CE marking.

User responsibility

When retrofitting a machine with electrical and electronic farm equipment and/or components connected to the vehicle's electrical system, it is your own responsibility to check whether the installation causes interference with the vehicle's electronic system or other components. This applies, in particular, to the electronic control of:

- electronic hoist control (EHR),
- front linkage,
- power take off (PTO),
- engine,
- gear.

Additional requirements

The following requirements must be met in order to retrofit mobile communication systems (e.g. radio, phone):

- All farm equipment must be approved and installed in accordance with the regulations applicable in the respective country (e.g. in Germany, the Federal Approvals Office for Telecommunications (BZT)).
- The equipment must be installed as a fixed installation.
- The operation of portable or mobile farm equipment in the interior of the vehicle is only permitted via a connection to a permanently installed exterior antenna.

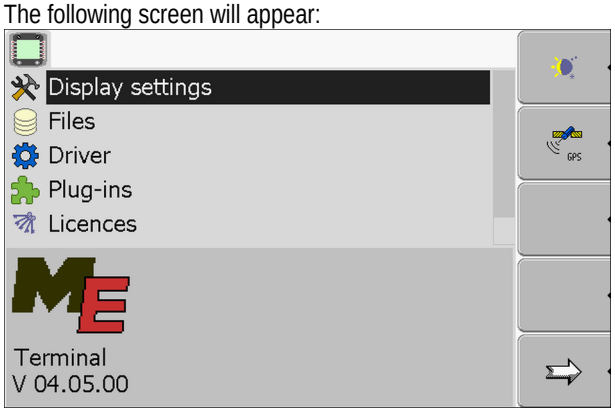
- The transmitting part must be spatially separated from the vehicle's electronic system.
- When attaching the antenna, pay attention to proper installation, including a sound ground connection between the antenna and the vehicle's ground wire.

For information on wiring and installation as well as the maximum allowable current consumption, please also refer to the installation guide provided by the machine manufacturer.

10.4 Checking the software version

Procedure

1. Open the "Service" application:
   | Service
2. The following screen will appear:



3. The software version can be found below the ME logo.

10.5 Technical specifications

10.5.1 Technical specifications of the display

Parameter	Value	
Operating voltage	10 - 30 V	
Operating temperature	-4°F - +158 °F	
Storage temperature	-22°F - +176 °F	
Weight	2.8 lb	
Dimensions (W x H x D)	8.8 x 8.4 x 3.8 in	
Protection class	IP 54 in accordance with DIN 40050/15	
EMC	In accordance with ISO 14982 / PREN 55025	
ESD protection	In accordance with 10605	
Power input	For display without GSM modem and without external devices.	Typically: 0.4A at 13.8 V
	For display with embedded GSM	Typically: 0.5A at 13.8 V

Parameter	Value	
	modem and without external devices.	
Display	VGA TFT color display; display size (diagonal): 5.8 inches ; resolution: 640 x 480 pixels	
Processor	32-bit ARM920T up to 400 MHz	
RAM	64 MB SDRAM	
Boot USB	128 MB	
Internal clock	Buffered by capacitor, keeps the time for 2 weeks without an external power supply.	
Keyboard	17 keys plus rotary knob.	
Outputs	2 x CAN 1 x USB 1.1 2 x RS232. Second RS232 with restricted functionality. 2 x M12 for two analog cameras (optional)	

10.5.2 Pin assignment of port A

Port A is a 9-pole D-sub port of the ISO agricultural machinery interface (CAN).

Pin no.:	Signal:	Pin no.:	Signal
1	CAN_L	6	- Vin[1] (GND)
2	CAN_L[1]	7	CAN_H[1]
3	CAN_GND[1]	8	CAN_EN_out[2]
4	CAN_H	9	+ Vin[1]
5	CAN_EN_in		

Legend:

+Vin = voltage supply (+)

–Vin = ground (-)

[1)] - Signals marked with [1] correspond to the CiA assignment (CAN in automation).

Both signals CAN_L and CAN_L[1] and/or CAN_H and CAN_H[1] are linked internally and used to loop the CAN bus through.

Assigning CAN_EN_in to the supply potential (= +Vin) enables the display to be switched on.

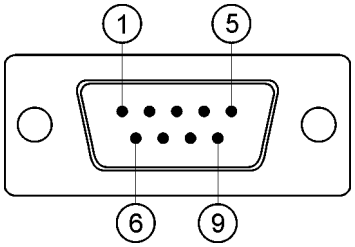
The signals '-Vin' and 'CAN_GND' are directly linked with both connectors, therefore it is crucial to avoid differences in potential between the pins of these two connectors.

[2] is compliant with TBC_Pwr in ISO 11783. When the display is switched on, this pin is under voltage (supply voltage minus approx. 1.2V).

10.5.3 Pin assignment of port B

The pin assignment of port B is dependent on the hardware version of the display. [➞ 10]

Displays with hardware versions from 3.0.0



9-pol. D-Sub connector

Port B is a 9-pole D-Sub port.

The connector can be used for the following purposes depending on its assignment:

Purpose	Pins used
As second CAN interface	7, 9
As second serial interface	2, 3, 4, 5
As signal input for two digital and one analog signal.	1, 5, 6, 8

Pin assignment of port B

Pin no.:	Signal:	Pin no.:	Signal
1	Wheel sensor[1]	6	PTO[2]
2	/RxD	7	CAN_H
3	/TxD	8	Working position sensor[3] or Reverse signal for determining the course
4	Voltage supply for GPS receiver A100[4]	9	CAN_L
5	GND		

Legend:

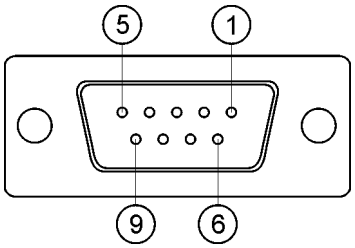
[1]) Digital input as per: ISO 11786:1995 chapter 5.2

[2]) Digital input as per: ISO 11786:1995 chapter 5.3

[3]) Analog input as per: ISO 11786:1995 chapter 5.5

[4]) The pin is switched in parallel with pin 4 by port C. Total loading is 600mA.

Terminals from hardware version 1.4.1



Port B is a 9-pole D-Sub socket.

Pin assignment of port B

Pin no.:	Signal:	Pin no.:	Signal
1	CAN_L	6	-Vin*
2	CAN_L*	7	CAN_H*
3	CAN_GND*	8	CAN_EN_out
4	CAN_H	9	+Vin
5	CAN_EN_in or Operating position sensor		

10.5.4 Pin assignment of port C

Port C is an RS232 interface

⚠ CAUTION

Damage to the equipment caused by short circuit

Pin 4 of port C is live. The voltage depends on the operating voltage of the display and is used to supply the DGPS Receiver A100 supplied by Mueller-Electronics.
Other GPS Receivers may suffer damage if connected to this port.
Before connecting a different GPS Receiver:

- Check what voltage the display is connected to (12 V or 24 V).
- Check the pin assignment of the GPS Receiver.
- Check the allowable voltage for the GPS Receiver.
- Compare the display voltage to the allowable voltage for the GPS Receiver.
- Compare the pin assignment.
- Only connect the GPS Receiver to the display, if the voltage range and pin assignment of both devices don't differ from each other.

Pin assignment of port C

Pin no.:	Signal
1	DCD
2	/RxD

Pin no.:	Signal
3	/TxD
4	Voltage supply for GPS receiver A100[1]
5	GND
6	DSR
7	RTS
8	CTS
9	RI (+5 V)

Legend:

[1]) The pin is switched in parallel with pin 4 by port B. Total loading is 600mA.

When switched on, the display routes current to the farm equipment that is connected via the RS232 connector. The voltage of the RS232 connector is dependent on the operating voltage of the display.

When connected to a 12 V battery, the display will transfer approx. 11.3 V to the connected equipment.

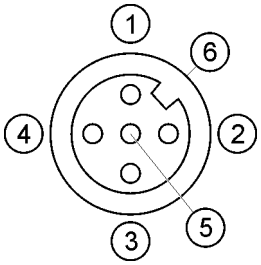
When connected to a 24 V battery, the display will transfer approx. 23.3 V to the connected equipment.

The use of a GPS Receiver only requires the signals RxD and TxD as well as GND.

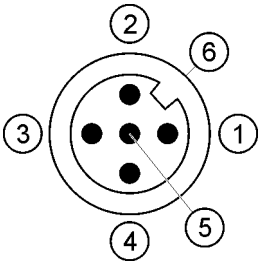
10.5.5 Pin assignment of camera ports 1 and 2

Ports 1 and 2 are used to connect an analog camera. The pin assignment is identical for both ports.

Ports 1 and 2 are 5-pin, A-encoded M12 sockets. Please refer to the following table for the pin assignment.



Pin assignment of the socket (in the display)



Pin assignment of the connector

Pin	Signal
1	Pin is exclusively intended for use by ME (do not connect anything)
2	GND
3	Pin is exclusively intended for use by ME (do not connect anything)

Pin	Signal
4	Video signal
5	Video screen
Outer sheathing	Screen

11 Notes